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ABSTRACT

This study assessed the utility of using both the American College Testing (ACT) Program composite score and high school grade point average (GPA) as predictors of students' success in college, as measured by the GPA at the end of the students' first semester in college. Data were obtained from 420 first-time entering freshmen at a medium-sized public regional university in Mississippi whose student body was 60 percent female and 23 percent minority. There were 326 white and 89 black students in the sample. The data included high school grades, ACT scores, four required college course grades, and freshman year GPAs. A regression analysis was performed using freshman year GPA as the dependent variable, with high school GPA and ACT composite score as independent variables. With a multiple R of 0.57, the relationship is significant, accounting for 32 percent of the variance in grade. Grades in required first semester courses were also studied. The data enable comparisons by race and sex. Broadening the base of admission standards to include multicultural diversity will probably be considered by more states in the wake of the U.S. Supreme Court decision on the "Ayers" case. The use of both the ACT score and high school grades would overcome the objections to using only the ACT score, which itself is not a good predictor of college success for many minority students. Six tables are included. (Author/RLC)

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RELATIONSHIPS AMONG HIGH SCHOOL GRADES, ACT TEST SCORES, AND COLLEGE GRADES

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ABSTRACT

Entrance requirements at Mississippi public universities have been based primarily on ACT scores. Those requirements are being broadened to include the student's high school grade point average, as a result of the recent U.S. Supreme Court decision on the Ayers case, declaring that present admissions standards "restrict the range of choices on entering students as to which institution they may attend..."

Data were obtained for 420 first-time entering freshmen at a medium-sized public regional university in Mississippi whose student body is 60% female, 23% minority. The data used in this study were high school grades, ACT scores, four required college course grades, and the freshman year grade point average.

Regression analysis was performed using the freshman year GPA as the dependent variable with high school GPA and ACT composite score as independent variables. With a multiple R of 0.57, the relationship is significant, accounting for 32% of the variance in grade.

Grades in required first semester courses were also studied. The data enabled comparisons by race and sex.

Broadening the base of admission standards to include multicultural diversity will probably be considered by more states in the wake of the Ayers decision.

Introduction

In ruling that Mississippi's public colleges remain illegally segregated, The Supreme Court has issued statements which potentially impact all public institutions. The Supreme Court declared that "race neutral" policies are not sufficient to end segregation if policies can be traced to de jure segregation. States must do more than merely eliminate segregation laws. The Supreme Court stated that all policies which can be traced back to the days of de jure segregation must be eliminated or justified as educationally sound.

The Court ruled that admission policies, originally adopted with a discriminatory purpose, continue to hurt Black students. Present admission policies are based primarily on ACT or SAT scores. Other factors, such as rank in class and high school grades, are not considered. In the past the use of only the ACT score was justified by citing the large variability in grading standards among the state's high schools.

The Board of Trustees of State Institutions of Higher Learning requires that students applying at the states five predominately white public universities must have an enhanced ACT score of 18, while the entrance requirement at the predominately Black universities is 15. In an effort to meet the requirements of the Ayers case, the Board of Trustees is modifying entrance requirements to include both ACT score and high school grades. The entrance requirement must be the same at all eight institutions.

In this study the use of ACT composite score and high school grade point average will be used to predict success in college, as measured by the grade point average at the end of the student's first semester in college.

METHOD

Data for 420 first-time, full-time freshmen at a medium-sized regional university in the Southeast were collected for the Fall 1991 semester. The entering freshman class included 326 white students and 89 Black students. Variables included the following:

sex;

race;

college major;

average high school grades in English, mathematics, social sciences, and natural sciences;

overall average high school grade;

ACT scores in English, mathematics, reading, and science reasoning;

composite ACT score;

semester hours attempted in the Fall semester;

college grades at the end of their first semester in freshman English, college algebra, world history, and general psychology;

grade point average at the end of the Fall semester.

The high school grades were self-reported by the students to ACT (American College Testing, Iowa City, IA) at the time they took the ACT test. ACT reports that the self-reported grades agree very closely with the actual high school grades. The high school grades and the ACT scores were supplied by ACT. The college grades were obtained from student records at the conclusion of the Fall semester.

RESULTS

Table 1 provides a brief definition of the variables used in this study. Descriptive statistics for the variables are presented in Table 2. Correlation coefficients (Pearson r) were calculated in order to determine the relationships among the various predictors and the final Fall semester grade point average (Table 3). Values of r greater than 0.10 indicate a significant relationship ($p < 0.025$). As expected the ACT subscores are highly correlated with each other and the college course grades are highly correlated with each other and the final Fall GPA.

Further analysis of correlations with Fall GPA reveals that, while white and Black students show the same correlation coefficient of high school grades with Fall GPA (0.36 and 0.37, respectively), the ACT composite score for white students is more highly correlated with Fall GPA ($r = 0.53$) than for Black students ($r = 0.26$). This supports some assertions in the Ayers case that the use of the ACT score alone is not a good predictor of college success and should not be the sole admissions criterion.

Regression analysis was performed using the final Fall semester grade (Fall_GPA) as the dependent variable with high school grades (HS_GPA) and ACT composite score (ACT_COMP) as independent variables (Table 4). With a multiple R of 0.57, the relationship is significant, accounting for 32 % of the variance in the final grade point average.

Of particular interest in this study is the use of high school grades and ACT to predict the Fall semester grade point average for Black students. Regression analysis was performed using the final Fall semester grade (Fall_GPA) as the dependent variable with high school grades (HS_GPA) and ACT composite score (ACT_COMP) as independent variables (Table 5). With a multiple R of 0.41, the relationship is significant, accounting for 17 % of the variance in the final grade point average. Results for regression analysis for white students are given in Table 6.

It is to be noted that the use of high school grades and ACT scores as predictors of college success is not as reliable for Black students as for white students. The regression equations were used to predict the final Fall GPA, using a high school GPA of 2.50 and an ACT composite score of 18. The predicted Fall GPA for white students is 1.9, while the predicted score for Black students is 1.6.

DISCUSSION

In order for the State of Mississippi to respond to the Supreme Court ruling in the Ayers case, admission requirements must

include factors other than ACT scores, and admission requirements must be the same at all state institutions. Admission requirements should be such that those who meet the requirements have a reasonable chance for success in college. Otherwise, admitting a student who is likely not to succeed is a disservice to the student.

This study explored the utility of using both ACT score and high school grades as predictors of success in college. The use of both factors would overcome the objections to using only the ACT score, which itself is not a good predictor of college success for many minority students.

Table 1

Definition of Variables

hrs_att	Semester hours attempted, Fall semester
DSU_ENG	Final grade in Freshman English, Fall semester
DSU_MAT	Final grade in college algebra, Fall semester
DSU_HIS	Final grade in world history, Fall semester
DSU_PSY	Final grade in general psychology, Fall semester
HS_ENG	Self-reported average high school English grade
HS_MAT	Self-reported average high school mathematics grade
HS_SOC	Self-reported grade in high school social studies
HS_SCI	Self-reported grade in high school science
HS_GPA	Self-reported overall high school average grade
ACT_ENG	ACT English score
ACT_MAT	ACT mathematics score
ACT_READ	ACT reading score
ACT_SCI	ACT score in science
ACT_COMP	Composite ACT score
SEX	Sex (1 = female, 2 = male)
RACE	Race (1 = white, 2 = black)
FALL_GPA	Final grade point average, Fall semester
MAJOR	College major

Table 2

Descriptive Statistics

css/pc: basic stats	Descriptive statistics in dbl precision N. of CASES = 420 (MD pairwise deleted)					
	N	Min	Max	Mean	Std.Err.	Std.Dev.
hrs_att	420	3.00000	23.00000	15.56905	.103880	2.128900
DSU_ENG	420	.00000	4.00000	1.53095	.062553	1.281964
DSU_MAT	420	.00000	4.00000	.72619	.063586	1.303119
DSU_HIS	420	.00000	4.00000	.66667	.056679	1.161570
DSU_PSY	420	.00000	4.00000	1.15476	.072498	1.485764
HS_ENG	420	.00000	4.00000	2.92476	.048120	.986160
HS_MAT	420	.00000	4.00000	2.62429	.052652	1.079039
HS_SOC	420	.00000	4.00000	3.05333	.049150	1.007283
HS_SCI	420	.00000	4.00000	2.78833	.051900	1.063624
HS_GPA	420	.00000	4.00000	2.84768	.045821	.939044
ACT_ENG	420	10.00000	36.00000	20.58571	.213478	4.374998
ACT_MAT	420	12.00000	30.00000	18.94524	.170266	3.489411
ACT_READ	420	.00000	35.00000	20.07381	.242898	4.977925
ACT_SCI	420	.00000	34.00000	18.98809	.183055	3.751512
ACT_COMP	420	12.00000	30.00000	19.81905	.163429	3.349295
RACE	420	1.00000	4.00000	1.24524	.024280	.497585
SEX	420	1.00000	2.00000	1.35714	.023408	.479729
Fall_GPA	420	.00000	4.00000	2.16567	.048287	.989595

Table 3

Correlation Coefficients

css/pc: basic stats	Correlations r(x,y) N. of CASES = 420 (MD pairwise deleted)															
standard mode	hrs_att	DSU_ENG	DSU_MAT	DSU_HIS	DSU_PSY	HS_ENG	HS_MAT	HS_SOC	HS_SCI	HS_GPA	ACT_ENG	ACT_MAT	ACT_READ	ACT_SCI	ACT_COMP	Fall_GPA
hrs_att	1.00	.15	.02	.01	.02	.02	.04	.05	.07	.05	-.03	.03	-.06	-.01	-.03	.09
DSU_ENG	.15	1.00	.14	.11	.04	.13	.10	.12	.14	.14	.06	.05	-.03	-.03	.01	.25
DSU_MAT	.02	.14	1.00	.18	.13	.25	.37	.25	.26	.31	.32	.44	.20	.24	.35	.46
DSU_HIS	.01	.11	.18	1.00	.27	.19	.18	.17	.22	.21	.25	.16	.18	.09	.21	.39
DSU_PSY	.02	.04	.13	.27	1.00	.14	.12	.15	.20	.17	.15	.13	.08	.05	.12	.38
HS_ENG	.02	.13	.25	.19	.14	1.00	.75	.83	.79	.93	.32	.27	.21	.17	.29	.29
HS_MAT	.04	.10	.37	.18	.12	.75	1.00	.72	.73	.89	.35	.45	.21	.28	.37	.38
HS_SOC	.05	.12	.25	.17	.15	.83	.72	1.00	.78	.91	.25	.25	.18	.19	.26	.28
HS_SCI	.07	.14	.26	.22	.20	.79	.73	.78	1.00	.91	.26	.27	.16	.18	.26	.37
HS_GPA	.05	.14	.31	.21	.17	.93	.89	.91	.91	1.00	.33	.35	.21	.23	.33	.37
ACT_ENG	-.03	.06	.32	.25	.15	.32	.35	.25	.26	.33	1.00	.55	.66	.53	.86	.52
ACT_MAT	.03	.05	.44	.16	.13	.27	.45	.25	.27	.35	.55	1.00	.44	.52	.74	.48
ACT_READ	-.06	-.03	.20	.18	.08	.21	.21	.18	.16	.21	.66	.44	1.00	.60	.84	.39
ACT_SCI	-.01	-.03	.24	.09	.05	.17	.28	.19	.18	.23	.53	.52	.60	1.00	.76	.33
ACT_COMP	-.03	.01	.35	.21	.12	.29	.37	.26	.26	.33	.86	.74	.84	.76	1.00	.53
Fall_GPA	.09	.25	.46	.39	.38	.29	.38	.28	.37	.37	.52	.48	.39	.33	.53	1.00

Table 4

Multiple Regression Analysis

All Freshmen

Multiple Regression Results:

Variables were entered in one block

Dependent Variable: Fall_GPA
Multiple R: .5658209
Multiple R-Square: .3201532
Adjusted R-Square: .3168926
Number of cases: 420
F (2, 417) = 98.18675 p < .0000
Intercept: -1.160333

css/pc multp. regress.	REGRESSION WEIGHTS					
variable	BETA	St. Err. of BETA	B	St. Err. of B	t (417)	Signif. of t
HS_GPA	.21632	.04270	.22797	.04500	5.06553	.00000
ACT_COMP	.45712	.04270	.13506	.01262	10.70430	.00000

css/pc multp. regress.	ANALYSIS OF VARIANCE				
Effect	Sums of Squares	df	Mean Square	F	Signif. of F
Regress.	131.3672	2	65.68362	98.18675	.00000
Residual	278.9589	417	.66897		
Total	410.3261				

Table 5

Multiple Regression Analysis

Black Freshmen

Multiple Regression Results:

Variables were entered in one block

Dependent Variable: Fall_GPA
Multiple R: .4128902
Multiple R-Square: .1704783
Adjusted R-Square: .1511871
Number of cases: 89
F (2, 86) = 8.83710 p < .0003
Intercept: -.545562

css/pc multp. regress.	REGRESSION WEIGHTS					
variable	BETA	St. Err. of BETA	B	St. Err. of B	t (86)	Signif. of t
HS_GPA	.33011	.10127	.31162	.09559	3.25986	.00160
ACT_COMP	.18026	.10127	.07551	.04242	1.78003	.07860

css/pc multp. regress.	ANALYSIS OF VARIANCE				
Effect	Sums of Squares	df	Mean Square	F	Signif. of F
Regress.	12.47331	2	6.23665	8.83710	.00032
Residual	60.69322	86	.70574		
Total	73.16653				

Table 6

Multiple Regression Analysis

White Freshmen

Dependent Variable: Fall_GPA
Multiple R: .5667682
Multiple R-Square: .3212262
Adjusted R-Square: .3170233
Number of cases: 326
F (2, 323) = 76.42905 p < .0000
Intercept: -.928605

css/pc multp. regress.	REGRESSION WEIGHTS					
variable	BETA	St. Err. of BETA	B	St. Err. of B	t (323)	Signif. of t
HS_GPA	.20038	.04893	.20649	.05043	4.09487	.00005
ACT_COMP	.46467	.04893	.13003	.01369	9.49562	.00000

css/pc multp. regress.	ANALYSIS OF VARIANCE				
Effect	Sums of Squares	df	Mean Square	F	Signif. of F
Regress.	97.2591	2	48.62953	76.42905	.00000
Residual	205.5153	323	.63627		
Total	302.7744				